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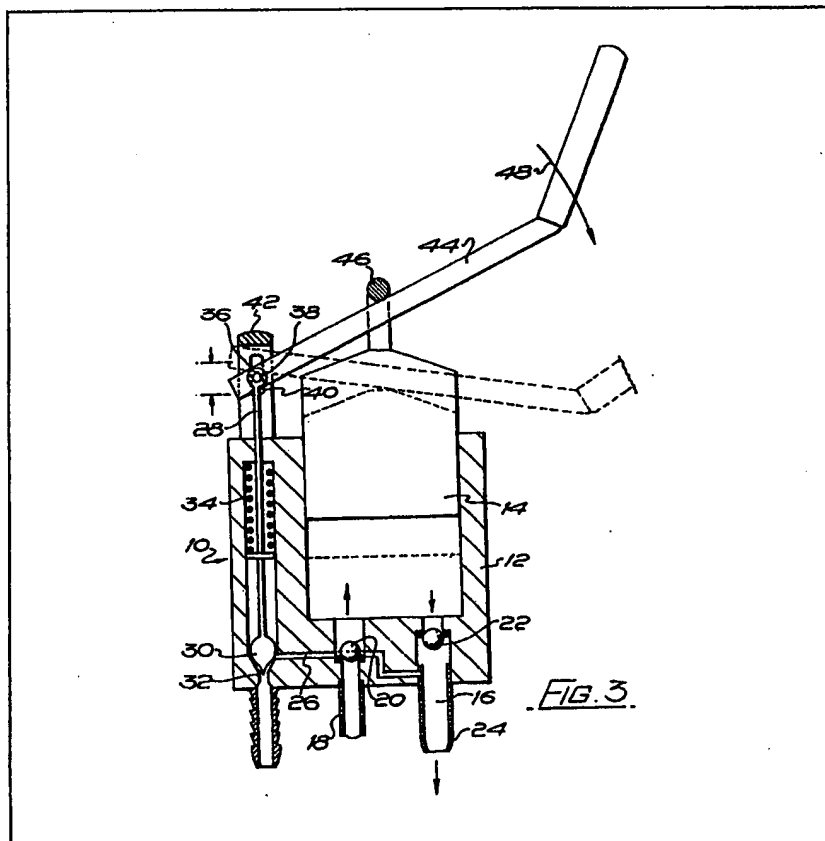
**ABSTRACT:**

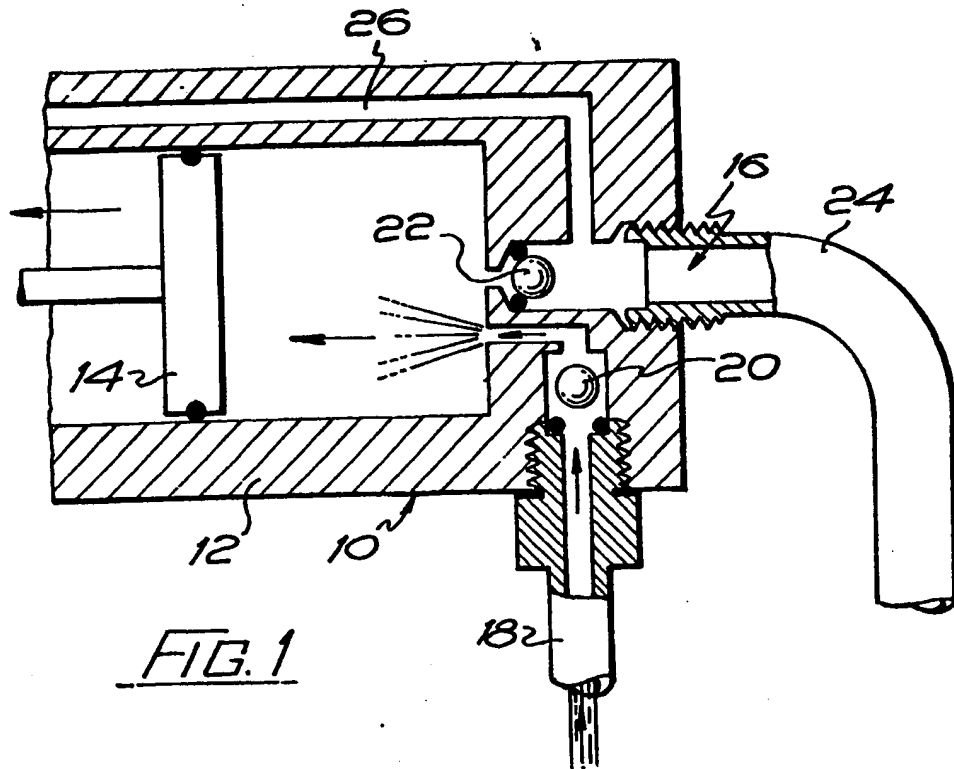
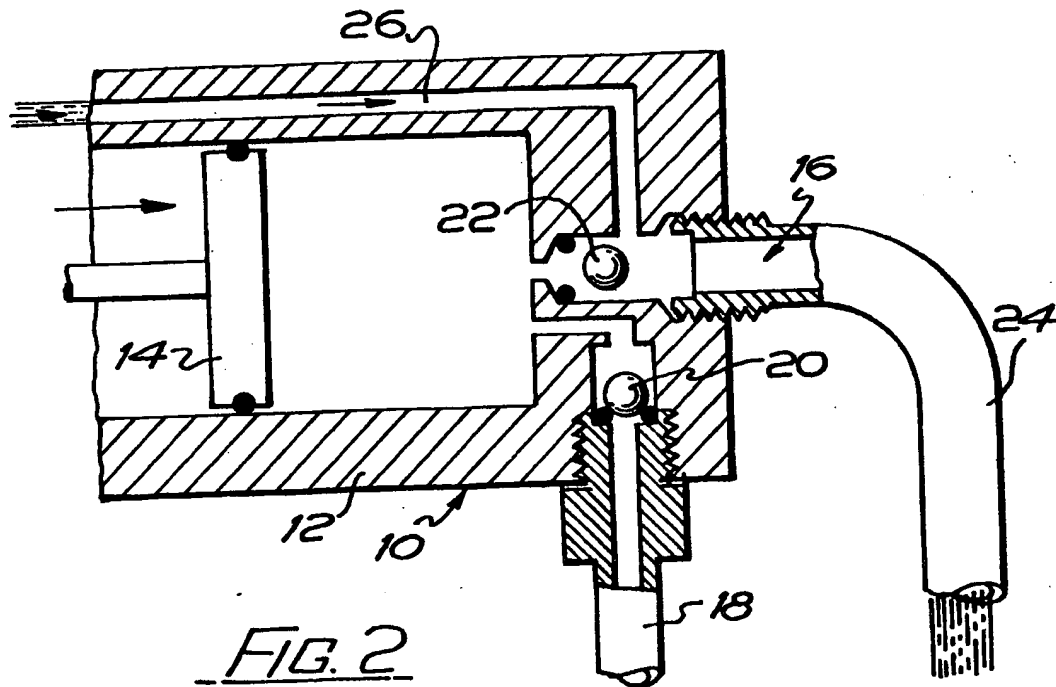
CHG DATE=19990617 STATUS=O> A beverage dispensing system comprises a dispensing head of which an operating member (14) can be manipulated to pump a quantity of flavouring syrup from an outlet of the head. At the same time said operating member opens a water passage 26 and water to mix or mixed with the syrup flows from the head. By manipulation of the operating member, the head can be arranged to dispense water only. 

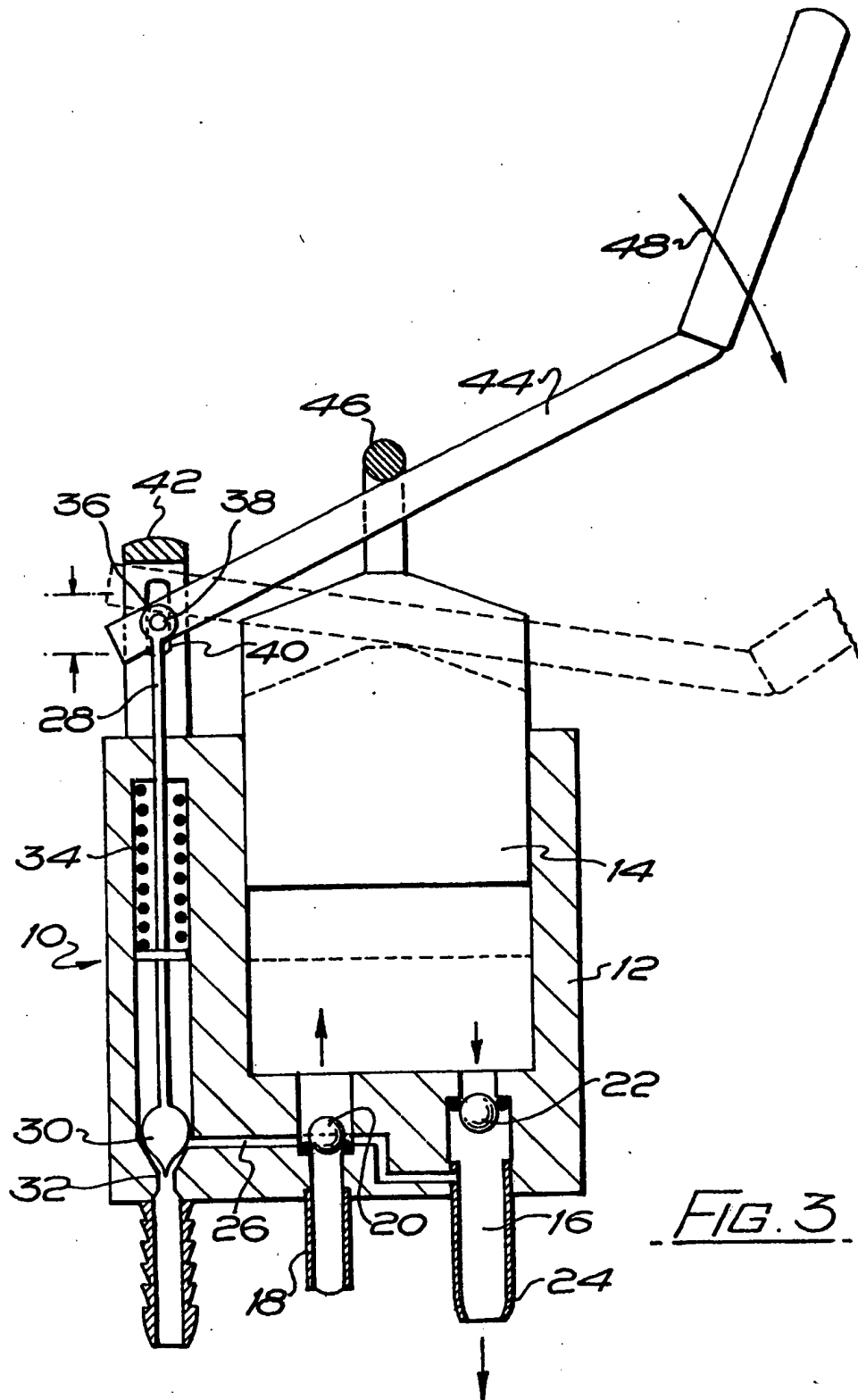
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(54) Post mix beverage dispensing system

(57) A beverage dispensing system comprises a dispensing head of which an operating member (14) can be manipulated to pump a quantity of flavouring syrup from an outlet of the head. At the same time said operating member opens a water passage 26 and water to mix or mixed with the syrup flows from the head. By manipulation of the operating member, the head can be arranged to dispense water only.



FIG. 1FIG. 2



## SPECIFICATION

## Post-mix beverage dispensing system

5 This invention relates to beverage dispensing systems which are known as post-mix beverage dispensing systems.

10 In post-mix dispensing systems, which are principally used for the dispensing of carbonated beverages, there is provided a dispensing head from which the beverage is dispensed directly into a drinking vessel for immediate consumption. From the dispensing head are dispensed water which is usually carbonated and a flavouring syrup which  
15 provides the beverage flavouring. These two components of the beverage may be dispensed from individual outlets directly into the drinking vessel in such a manner that they mix effectively in the drinking vessel to provide the final beverage. Alternatively, the beverage components may be mixed in the dispensing head and discharged from a single outlet.

20 As can be appreciated, to provide the most effective mixture of the water and syrup, the quantities of the two components should be accurately controlled, but in existing post-mix dispensing systems this is not always achieved, and this can result in wastage, especially of the flavouring syrup.

30 The present invention is concerned with the provision of a dispensing head for a post-mix dispensing system, whereby the quantity of syrup can be accurately metered for each quantity of beverage to be dispensed.

35 In accordance with the present invention, a dispensing head of a post-mix dispensing system includes a syrup metering chamber through which a displaceable member moves to define a swept volume so that accurate quantities of syrup will be pumped at each operation of the dispensing head,  
40 the dispensing head including a discharge passage leading to a dispensing outlet into which passage the metered quantities of syrup are discharged from the metering chamber, the dispensing head further including a water supply passage leading to said  
45 discharge passage so that water can be supplied to said passage to mix with metered quantities of syrup therein to provide the final beverage which is dispensed from the outlet.

50 Also in accordance with the present invention, a dispensing head of a post-mix dispensing system includes a syrup metering chamber through which a displaceable member moves to define a swept volume so that accurate quantities of syrup will be pumped at each operation of the dispensing head,  
55 the dispensing head including a discharge passage leading to a dispensing outlet and into which passage the metered quantities of syrup are discharged from the metering chamber, the dispensing head further including a water supply passage which  
60 is normally closed by valve means but which is openable at each operation of the dispensing head to enable the flow of water from the head to mix with metered quantities of syrup therein to provide the final beverage.

65 Preferably, said water supply passage is normally

closed by valve means and is operable at each operation of the dispensing blade to enable flow of water along said water supply passage and to said outlet.

70 The metering chamber may be a cylinder and the displaceable member is a piston, the inflow and out flow of syrup to said metering chamber being controlled by one way valves respectively in a syrup supply passage leading to the chamber, and said  
75 discharge passage.

There may be control means controlling the supply of water to said water supply passage in synchronism with the actuation of the piston effecting the discharge of the metered quantities of syrup  
80 so that the syrup can be added to the water after same has commenced flow in the discharge passage, the metered quantities of syrup being supplied such that each metered quantity of syrup is injected into the water in the discharge passage, before the  
85 flow of the corresponding portion of water through said discharge passage has terminated, thereby to ensure effective mixing.

Said control means is preferably actuatable to permit only flow of water from the dispensing head  
90 if desired.

The said control means may include a handle adapted to rock on the said piston, one end of the handle being for grasping with the hand, and the other end being operatively connected to the valve  
95 controlling the water flow, so that the handle can be rocked on the piston, without displacing same, to open the water flow valve and permit flow of water only from the dispensing head.

100 The water will normally be carbonated and chilled, and to this end the system with which the dispensing head is used will include conventionally used components of equipment such as a water cooler and a water carbonator. The carbonator and cooler may be combined in a single unit, as is also known.

105 The dispensing head is preferably in the form of a block provided with suitable drillings to define the said cylinder and the water supply passage, and at least part of the discharge passage. Part of the discharge passage leading to the outlet may be defined by an appropriate spout.

An embodiment of the invention is illustrated in the accompanying drawings, in which:-

110 *Figure 1* is a sectional diagrammatic view of part of a dispensing head of a post-mix beverage dispensing system in the condition in which syrup is being drawn into the dispensing chamber of the head;

115 *Figure 2* is a cross sectional elevation similar to *Figure 1*, but showing the head in the condition in which the syrup is being discharged from the said dispensing chamber; and

120 *Figure 3* is a specific embodiment of a dispensing head according to the invention.

Referring to *Figures 1* and *2*, which illustrate the principles of operation of the head shown in *Figure 3*, the dispensing head is shown to comprise a block  
125 of suitable material such as metal or plastics material. The block is elongated and is drilled to define a dispensing chamber in the form of a cylinder 12 which contains the displaceable member  
130

In the form of piston 14. The piston can stroke back and forth in order to sweep through the cylinder and to discharge metered quantities of syrup into a discharge passage 16. Reference 18 indicates a pipe 5 for the supply of syrup to the cylinder 12 from a bulk supply and flow of syrup from the passage 10 into cylinder 12 is controlled by a one way valve 20.

Discharge of syrup into the discharge passage 16 is controlled by one way valve 22. The discharge 10 passage is made up of a drilling in the block 10, and a spout 24 which leads to a discharge outlet from which the beverage is dispensed directly into a drinking vessel.

The body 10 is further drilled to provide a water 15 supply passage 26, and passage 26 leads (as shown) into the discharge passage 16 in that portion formed in the block 10. In the majority of cases, the water which is supplied through the passage 26 will be chilled and carbonated, although it is to be pointed 20 out that the use of chilled carbonated water is not essential as regards use of the dispensing head of the present invention.

When carbonated water is supplied to the dispensing head, it will normally be under pressure so that a 25 metered quantity of water can be supplied in a quantity dictated by the time during which the water is free to flow to the dispensing head, as controlled by suitable control means of which a preferred form is shown in Figure 3.

30 The operation of the dispensing head thus far described is as follows. When a quantity of beverage is to be dispensed from the head, a lever is operated, which causes the piston 14 to move to the left in an induction stroke as shown by the arrow in Figure 1 35 and a metered quantity of syrup is drawn into the cylinder 12 as dictated by the piston displacement. The induction stroke is followed by a discharge stroke in which the piston 14 moves to the right in Figure 2 and indicated by the arrow in such figure, 40 and a metered quantity of syrup is discharged past the valve 22 and into discharge passage 16, valve 20 being seated by virtue of the back pressure and preventing return flow through the syrup supply passage 18. The operation to move the piston 14 45 controls the flow of water through the passage 26, as will be described in relation to Figure 3, such that the water will commence flowing before commencement of the discharge of the metered quantity of syrup so that the discharged syrup meets and mixes 50 with the flowing water in discharge passage 16. Furthermore, the discharge of the syrup is terminated before termination of the flow of water in order to ensure thorough and effective mixing. It is to be remembered that to make a beverage, water will be 55 supplied in a much higher volume than the syrup.

Referring now to Figure 3, parts corresponding to parts already described have the same reference numerals, and it will be seen that the piston 14 is in the form of a cylindrical block, of which the top end 60 is of shallow trunkated form as shown. The block 10 also houses a valving arrangement for controlling the flow of water to passage 26 and to outlet spout 24. The valving arrangement comprises a dropper 28 having a sealing bulb 30 at the lower end thereof 65 which engages a seat 32 when the dropper 28

prevents flow of water to passage 26. A spring 34 urges the dropper 28 to the position in which bulb 30 sealingly engages seat 32. At its top end, the dropper 28 has an eye 36 in which is engaged a crosspin 38.

70 The ends of pin 38 engage in slots 40 in a pair of support arms 42, and the slots extend in the same direction in which the dropper 28 can move. Pivotaly mounted on the pin 38 is an operating handle 44 which passes through a U-shaped retainer bar 46. 75 The specific construction described enables the dispensing head to be controlled in an extremely effective and simple manner. Assuming the head is in the condition shown, i.e. the piston 14 has been retracted, and has drawn in a quantity of syrup 80 through pipe 18, and the dropper 28 seals the flow of water to passage 26. If it is required now to dispense the beverage mixture into the vessel, the handle 44 is pivoted downwards as indicated by arrow 48. The handle 44 first of all engages the frustoconical top of 85 piston 14, which acts as a temporary fulcrum, and the dropper 28 is raised as permitted by movement of pin 38 in the slots 40, and bulb 30 unseats from seat 32, permitting flow of water immediately to 90 passage 16, and initially water flows from the outlet spout 24 into the collecting vessel. If desired, the dispensing head can be maintained in this condition, and water only will be dispensed from the dispensing head, which is not an unusual requirement, e.g. 95 soda water for drinking or mixing with alcoholic beverages etc. The time during which the water will flow and therefore the quantity which is dispensed is entirely under the control of the user. If, as will normally be the case, the flavoured beverage is to be dispensed, continued movement of the handle 44 100 pushes the piston 14 downwards, the axle 38 acting as a pivot point, and the metered quantity of syrup is dispensed together with the water out of the dispensing outlet 24, until the piston 14 reaches the dotted line position shown in Figure 3. The flow of 105 water into the passage 26 is continued as long as pressure is exerted on the handle 44, but as soon as the pressure is removed, spring 34 returns dropper 28 to the water flow preventing position. The said pressure will of course not be removed until the vessel has been filled with water to a sufficient extent, but in any case the water flow is entirely 110 under the control of the person dispensing the beverage. The dispensing head will be designed so that for a maximum stroke of the piston 14, the amount of syrup which is dispensed is sufficient to provide a cupful of a palatable beverage, but of course by manipulating the handle more or less 115 syrup can be dispensed at will.

When it is desired to raise the piston 14 to the full 120 line position shown in Figure 3, the handle 44 is raised in the opposite direction from arrow 48. Handle 44 meets U-shaped bracket 46, which is attached to the piston 14, and by virtue of the in 38 acting as a pivot point, the piston 14 can be raised 125 inducing a further quantity of syrup, and a complete cycle of operations has been completed. It will be understood that the arrangement of the U-shaped bracket 46, the handle 44, and the pivot pin 38 located in slots 40, provides an extremely simple and 130 effective arrangement for controlling the dispensing

of the water and the syrup. It is also to be noted that the handle 44 can be manipulated, when the piston 14 is in the lowermost position, to arrange for only the supply of water to take place. To this end, the person dispensing the water simply as hereinbefore described, applies pressure to the lever 44 so that it rocks on the top of the piston 14, raising the dropper 28.

The dispensing head provides an extremely effective metering and mixing arrangement. It economises on the use of the syrup, and the mixing arrangement mitigates against what is known as "layering" which is an effect which sometimes occurs when syrup and water are discharged separately into the drinking vessel, and there is inefficient mixing of the two constituents such that the syrup, which is much denser, tends to precipitate and "layer" towards the bottom of the drinking vessel.

It may be possible to induce the water into the discharged passage 16 by virtue of the flow of syrup therethrough instead of arranging for the water to be supplied under pressure, and we can foresee that the head could perhaps be used for the mixing of other liquid constituents to produce a mixture which may not in fact be a beverage.

The invention also provides a post-mix dispensing system, including a dispensing head according to the invention as set forth herein.

Instead of using a displaceable piston as described, it would also be possible to use a flexible diaphragm displaceable member.

#### CLAIMS

1. A dispensing head for a post-mix dispensing system including a syrup metering chamber through which a displaceable member moves to define a swept volume so that accurate quantities of syrup will be pumped at each operation of the dispensing head, the dispensing head including a discharge passage leading to a dispensing outlet and into which passage the metered quantities of syrup are discharged from the metering chamber, the dispensing head further including a water supply passage leading to said passage to mix with metered quantities of syrup therein to provide the final beverage which is dispensed from the outlet.

2. A dispensing head according to Claim 1, wherein said water supply passage is normally closed by valve means and is operable at each operation of the dispensing head to enable flow of water along said water supply passage and to said outlet.

3. A dispensing head for a post-mix dispensing system including a syrup metering chamber through which a displaceable member moves to define a swept volume so that accurate quantities of syrup will be pumped at each operation of the dispensing head, the dispensing head including a discharge passage leading to a dispensing outlet and into which passage the metered quantities of syrup are discharged from the metering chamber, the dispensing head further including a water supply passage which is normally closed by valve means but which is operable at each operation of the dispensing head

to enable the flow of water from the head to mix with metered quantities of syrup therein to provide the final beverage.

4. A dispensing head according to Claim 2 or 3, wherein the dispensing head is operable by means of a control handle, which serves to displace the displaceable member and open the valve closing the water supply passage, said handle being operable in at least one position of the displaceable member to open the valve closing the water supply passage without displacing the displaceable member.

5. A dispensing head according to claim 4 wherein the displaceable member is a piston, and the handle not only serves to displace the piston but is also rockable therein in said at least one position, to open the valve closing the water supply passage.

6. A dispensing head according to Claim 5, wherein the valve closing the water supply passage is spring loaded to the closed position.

7. A dispensing head for a post-mix dispensing system, substantially as hereinbefore described with reference to the accompanying drawings.

8. A post-mix displacing system including a post-mix dispensing head according to any of Claims 1 to 7.

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